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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/018,054	03/27/2002	Robert Bruce Charters	P07446US00/RFH	5453

881 7590 09/25/2003  
LARSON & TAYLOR, PLC  
1199 NORTH FAIRFAX STREET  
SUITE 900  
ALEXANDRIA, VA 22314

EXAMINER	
PETKOVSEK, DANIEL J	
ART UNIT	PAPER NUMBER
2874	

DATE MAILED: 09/25/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)
	10/018,054	CHARTERS ET AL.
Examiner	Art Unit	
Daniel J Petkovsek	2874	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) Responsive to communication(s) filed on \_\_\_\_\_.
- 2a) This action is **FINAL**.                            2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-5, and 7 is/are rejected.
- 7) Claim(s) 6 is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on December 14, 2001 is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) The proposed drawing correction filed on \_\_\_\_\_ is: a) approved b) disapproved by the Examiner.  
 If approved, corrected drawings are required in reply to this Office action.
- 12) The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All b) Some \* c) None of:
  1. Certified copies of the priority documents have been received.
  2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
 \* See the attached detailed Office action for a list of the certified copies not received.
- 14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
 a) The translation of the foreign language provisional application has been received.
- 15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3/27/02.
- 4) Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_.
- 5) Notice of Informal Patent Application (PTO-152)
- 6) Other: *Ben Heet*

**DETAILED ACTION**

***Priority***

1. This application is a 371 of PCT/AU00/00698, filed June 21, 2000. Priority is also acknowledged to Australia PQ 1110, filed on June 21, 1999.

***Information Disclosure Statement***

2. The prior art documents submitted by Applicant in the Information Disclosure Statements filed on March 27, 2002, have been considered and made of record (note attached copy of forms PTO-1449).

***Specification***

3. This application does not contain an abstract of the disclosure as required by 37 CFR 1.72(b). An abstract on a separate sheet is required.

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, 4, 5, and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Farina U.S.P. No. 5,118,923.

Farina U.S.P. No. 5,118,923 teaches (ABS, Figs. 4 and 6, column 4 line 14-42, column 5 lines 17-36) a device (and inherent method of same) for forming a digital directional coupler 22, comprising at least two waveguides 28 and 30, by scanning a CO<sub>2</sub> laser source across a photosensitive material 50 to induce refractive index changes in the waveguides, in which

tapering regions or sections can be formed in the waveguides, when different laser scans are used (see column 6, lines 23-33). Regarding claim 4, it is inherent that the function increasing coupling strength between the parallel waveguides. Regarding claim 5, the material is planar. Regarding claim 7, product-by-process claims are not limited to the manipulations of the recited steps, only the structure implied by these steps (see MPEP 2113).

6. Claims 1, 4, 5, and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Mahapatra U.S.P. No. 4,886,538.

Mahapatra U.S.P. No. 4,886,538 teaches (Figs. 1 and 2, column 3 line 31, through column 4 line 32) a device (and inherent method of forming same) in which a digital directional coupler, comprised of parallel waveguides (see column 5, lines 9-14) is formed by scanning a laser beam across photosensitive material to induce changes in the refractive index, wherein the laser is varied to form a refractive index taper (12 to 12A) in the form of the waveguide(s). Regarding claim 4, it is inherent that the function increasing coupling strength between the parallel waveguides. Regarding claim 5, the material 11 is planar. Regarding claim 7, product-by-process claims are not limited to the manipulations of the recited steps, only the structure implied by these steps (see MPEP 2113).

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Farina U.S.P. No. 5,118,923 as applied to claim1 above, and further in view of 1449 IDS reference to Charters et al.

Farina U.S.P. No. 5,118,923 teaches (ABS, Figs. 4 and 6, column 4 line 14-42, column 5 lines 17-36) a device (and inherent method of same) for forming a digital directional coupler 22, comprising at least two waveguides 28 and 30, by scanning a CO<sub>2</sub> laser source across a photosensitive material 50 to induce refractive index changes in the waveguides, in which tapering regions or sections can be formed in the waveguides, when different laser scans are used. Farina '923 does not explicitly teach that the laser is a TEM01\* laser or a laser having a doughnut type irradiance distribution.

Charters et al teaches the use of a TEM01\* laser beam with doughnut intensity distributions to create step-like refractive index profiles to be written in photosensitive materials, shown to be beneficial in writing in small integrated circuits.

Since Farina '923 and Charters et al are both from the same field of endeavor, the purpose of using a different type of laser, a TEM01\* laser beam with doughnut intensity distributions for improved writing in waveguides, would have been recognized in the pertinent art of Farina '923.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to use different efficient laser writing practices, such as the TEM01\* laser beam with doughnut intensity distributions of Charters et al. for the purpose of improving efficiency in the waveguide writing of Farina '923.

9. Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mahapatra U.S.P. No. 4,886,538 as applied to claim 1 above, and further in view of 1449 IDS reference to Charters et al.

Mahapatra U.S.P. No. 4,886,538 teaches (Figs. 1 and 2, column 3 line 31, through column 4 line 32) a device (and inherent method of forming same) in which a digital directional coupler, comprised of parallel waveguides (see column 5, lines 9-14) is formed by scanning a laser beam across photosensitive material to induce changes in the refractive index, wherein the laser is varied to form a refractive index taper (12 to 12A) in the form of the waveguide(s). Mahapatra '538 does not explicitly teach that the laser is a TEM01\* laser or a laser having a doughnut type irradiance distribution.

Charters et al teaches the use of a TEM01\* laser beam with doughnut intensity distributions to create step-like refractive index profiles to be written in photosensitive materials, shown to be beneficial in writing in small integrated circuits.

Since Mahapatra '538 and Charters et al are both from the same field of endeavor, the purpose of using a different type of laser, a TEM01\* laser beam with doughnut intensity distributions for improved writing in waveguides, would have been recognized in the pertinent art of Mahapatra '538.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to use different efficient laser writing practices, such as the TEM01\* laser beam with doughnut intensity distributions of Charters et al. for the purpose of improving efficiency in the waveguide writing of Mahapatra '538.

*Allowable Subject Matter*

10. Claim 6 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The relevant prior art does not teach or reasonably suggest a method in which the scanning speed is varied in order to create waveguide refractive index tapers that are tapered in opposite directions.

*Inventorship*

11. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

*Conclusion*

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure, with respect to the state of the art of tapered directional coupling waveguides: PTO-892 form references B and C.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel J Petkovsek whose telephone number is (703) 305-6919. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney Bovernick can be reached on (703) 308-4819. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 872-9321.

  
Daniel Petkovsek  
September 11, 2003

